

## **WHAT IS CLAIMED IS:**

1. An apparatus for controlling a data write operation in an optical storage system comprising an operational amplifier having a positive input end, a negative input end and an output end for outputting a write-control signal at the 5 output end, the operational amplifier being operated in one of a short-term mode, a long-term mode and a closed-loop mode; wherein

in the short-term mode, the operational amplifier is formed as a voltage follower for initializing the write-control signal;

10 in the long-term mode, the operational amplifier charges the write-control signal; and

in the closed-loop mode, the charged write-control signal is employed to record data on a CD.

2. The apparatus for controlling a data write operation in an optical storage system as claimed in claim 1, wherein in the short-term mode, the positive input 15 end of the operational amplifier is coupled to a reference voltage, and the negative input end thereof is coupled to the output end for forming a voltage follower so as to initialize the write-control signal.

20 3. The apparatus for controlling a data write operation in an optical storage system as claimed in claim 1, wherein in the long-term mode, the positive input end and the negative input end of the operational amplifier are virtually grounded.

25 4. The apparatus for controlling a data write operation in an optical storage system as claimed in claim 3, wherein in the long-term mode, the output end of the operational amplifier is coupled to the negative input end thereof and the positive input end of the operational amplifier couples to a voltage level used for recording data onto a compact disk for charging the write-control signal.

5. The apparatus for controlling a data write operation in an optical storage system as claimed in claim 4, wherein in the long-term mode, the operational amplifier charges the write-control signal to the voltage level used for recording data onto the compact disk.

5      6. The apparatus for controlling a data write operation in an optical storage system as claimed in claim 1, wherein in the closed-loop mode, the operational amplifier inputs a feedback control signal from a read/write head of the apparatus and the feedback control signal is amplified and fed back to the negative input end of the operational amplifier.

10     7. The apparatus for controlling a data write operation in an optical storage system as claimed in claim 6, further comprising a sampling and holding circuit and a gain amplifier, in which the sampling and holding circuit receives the feedback control signal and the feedback control signal is amplified by the gain amplifier, and the feedback control signal is amplified before being sent to the negative input end of the operational amplifier.

15     8. The apparatus for controlling a data write operation in an optical storage system as claimed in claim 1, wherein when the writing operation is completed, the short-term mode is actuated again so as to initialize the write-control signal again.

20     9. A method for controlling a data write operation in an optical storage system comprising the steps of:  
executing a short-term mode for initializing a write-control signal by using virtually grounding effect;  
executing a long-term mode for charging the write-control signal by using virtually grounding effect; and

executing a closed-loop mode for employing the charged write-control signal for recording data onto a compact disk.

10. The method for controlling a data write operation in an optical storage system as claimed in claim 9, further comprising a step of initializing the  
5 write-control signal within the short-term mode.

11. The method for controlling a data write operation in an optical storage system as claimed in claim 9, further comprising a step of using a digital to analog control signal to control the charging operation of the write-control signal.

12. The method for controlling a data write operation in an optical storage  
10 system as claimed in claim 11, wherein in the closed-loop mode, the write-control signal is used for controlling the recording operation.

13. The method for controlling a data write operation in an optical storage system as claimed in claim 9, further comprising a step of re-executing the long-term mode after the recording operation for re-initializing the write-control  
15 signal.

14. The method for controlling a data write operation in an optical storage system as claimed in claim 9, further comprising a step of using a first time period control signal, a second time period control signal and a third time period control signal for controlling the operational amplifier to be operated in the short-term  
20 mode, the long-term mode and the closed-loop mode, in which the first and second time period control signals are switched between a first level and a second level.

15. A read/write device used in an optical storage system comprising:  
a read-control device for generating a read-control signal in response to a  
25 feedback control signal;

a write-control device having an operational amplifier for generating a write-control signal in response to the feedback control signal, wherein the operational amplifier is formed as a voltage follower for initializing the write-control signal when being operated in a short-term mode; the operational  
5 amplifier charges the write-control signal in advance when being operated in a long-term mode; the charged write-control signal is used to control an operation of recording data onto a compact disk when the operational amplifier is operated in a closed-loop mode,; and

10 a read/write head for generating a laser beam in response to the read-control signals, the write-control signals, a read-enable signal, and a write-enable signal, wherein the read/write head generates a feedback signal based on the laser beam for being fed back to the read-control device and the write-control device.

15 16. The read/write device as claimed in claim 15, wherein the operational amplifier has a positive input end, a negative input end and an output end, and the output end of the operational amplifier serves for outputting the write-control signal.

20 17. The read/write device as claimed in claim 16, wherein in the short-term mode, the positive input end of the operational amplifier is coupled to a reference voltage, and the negative input end thereof is coupled to the output end for forming a voltage follower so as to initialize the write-control signal.

18. The read/write device as claimed in claim 16, wherein in the long-term mode, the positive input end and the negative input end of the operational amplifier are virtually grounded.

25 19. The read/write device as claimed in claim 18, wherein in the long-term mode, the output end of the operational amplifier is coupled to the negative input end thereof and the positive input end of the operational amplifier inputs a voltage

used for recording data onto the compact disk for charging the write-control signal to a voltage level for writing data to the compact disk.

20. The read/write device as claimed in claim 16, wherein in the closed-loop mode, the operational amplifier reads a feedback control signal from the 5 read/write head of the write control device and the feedback control signal is amplified and fed back to the negative input end of the operational amplifier.

21. The read/write device as claimed in claim 20, further comprising: a sampling and holding circuit and a gain amplifier, wherein the sampling and holding circuit receives the feedback control signal and the gain amplifier 10 amplifies the feedback control signal and sends the amplified feedback control signal to the negative input end of the operational amplifier.

22. The read/write device as claimed in claim 15, wherein the long-term mode is executed again after the writing operation for re-initializing the write-control signal.